8 A bus is travelling along a straight road at $5.4\,\text{m s}^{-1}$. At $t = 0$, as the bus passes a boy standing on the pavement, the boy starts running in the same direction as the bus, accelerating at $1.2\,\text{m s}^{-2}$ from rest for 5 s. He then runs at constant speed until he catches up with the bus.

(a) The diagram in the Printed Answer Booklet shows the velocity-time graph for the bus.

Draw the velocity-time graph for the boy on this diagram. **[3]**

(b) Determine the time at which the boy is running at the same speed as the bus. **[2]**

(c) Find the maximum distance between the bus and the boy. **[3]**

(d) Find the distance the boy has run when he catches up with the bus. **[3]**